WHAT IS CLAIMED IS:

1. A complex wireless service apparatus using a wired and wireless communication system, the apparatus comprising:

a home location register for storing a database of a mobile communication phone number for the complex wireless terminal which supports plural band and plural mode, whether an extension location is inside or outside, a public phone number, and a wireless terminal unique number;

a mobile switching center for performing an extension location registration for the complex wireless terminal in the home location register when the extension location registration is requested by the complex wireless terminal, and, when an incoming request is made in the complex wireless terminal, trying the incoming using the public phone number of the complex wireless terminal and wireless terminal unique number when the complex wireless terminal is located in the premises with reference to the home location register and trying the incoming using the mobile communication phone number when the complex wireless terminal is located in a mobile communication service area; and

a wired and wireless complex gateway for trying an incoming with the complex wireless terminal using the wireless terminal unique number transmitted from the mobile switching center through the public exchange when the incoming request including the wireless terminal unique number for the complex wireless terminal is made from the mobile switching center.

2. The apparatus according to claim 1, wherein the complex wireless terminal includes a

high frequency unit for supporting the plural bands and a base band unit for supporting the plural modes and supports the plural bands and plural modes among code-division multiple access, group special mobile, wideband code division multiple access, wireless local area network, and BLUETOOTH communication methods.

3. The apparatus according to claim 2, wherein the complex wireless terminal periodically monitors strength of a pilot signal of the other system when a system provides a service by obtaining signals of the plural bands and plural modes from a corresponding system in an idle state to collect information and confirming whether the system is serviced, and, when the complex wireless terminal moves from a mobile communication service area to an extension wireless network service area, when a pilot signal of an access point in the extension wireless network service area is sensed, registers the mobile switching center in the home location register by transmitting an access point pilot signal sensing message to the mobile switching center.

4. The apparatus according to claim 1, wherein the home location register stores whether the extension service for the complex wireless terminal is supported in the database to manage, and the mobile switching center confirms information on a location of the complex wireless terminal registered in the home location register when there is an incoming request for the complex wireless terminal, and tries the incoming using a public phone number of the complex wireless terminal and a wireless terminal unique number when the complex wireless terminal is located in the premises and the extension service can be supported.

5. The apparatus according to claim 1, wherein an incoming request including the wireless terminal unique number for the wired and wireless complex gateway of the mobile switching center enables the mobile terminal unique number and outgoing number to be transmitted to the wired and wireless complex gateway using an outgoing phone display service by the mobile switching center.

6. A complex wireless service apparatus using a wired and wireless communication system, the apparatus comprising:

a home location register for storing a database of a mobile communication phone number for the complex wireless terminal which supports plural band and plural mode, whether an extension location is inside or outside, a public phone number, and a wireless terminal unique number;

a mobile switching center for providing, when the complex wireless terminal moves to an extension wireless service area and requests location registration while making a communication with the base station transceiver subsystem through a base station controller, a communication without any disconnection by registering the extension location for the complex wireless terminal in the home location register and providing an extension wireless network using a public phone number and a unique number of the complex wireless terminal, and, providing, when the complex wireless terminal moves to a mobile communication service area and requests an extension location registration cancellation while making a communication to a public exchange through an extension wireless service network, a communication without any disconnection by performing the extension location registration cancellation for the complex wireless terminal in the home location register and

providing a mobile communication service to a base station transceiver subsystem for the complex wireless terminal through the base station controller; and

a wired and wireless complex gateway for establishing a communication line to the complex wireless terminal using a wireless terminal unique number transmitted from the mobile switching center through the public exchange when a communication line establishment request including the wireless terminal unique number for the complex wireless terminal is made from the mobile switching center.

7. The apparatus according to claim 6, wherein the complex wireless terminal includes a high frequency unit for supporting plural bands and a base band unit for supporting plural modes and supports plural bands and plural modes among code-division multiple access, group special mobile, wideband code division multiple access, wireless local area network, and BLUETOOTH communication methods.

8. The apparatus according to claim 7, wherein the complex wireless terminal periodically monitors strength of a pilot signal of the other system even when a system provides a service by obtaining signals of the plural bands and plural modes from a corresponding system in an idle state to collect information and confirming whether the system is serviced, and, in the case that the complex wireless terminal moves from a mobile communication service area to an extension wireless network service area, when a pilot signal of an access point in the extension wireless network service area is sensed, registers the mobile switching center in the home location register

by transmitting an access point pilot signal sensing message to the mobile switching center.

9. A complex wireless service method of a wired and wireless communication system including a complex wireless terminal for supporting plural band and plural mode, a home location register for storing whether the complex wireless terminal is located in the premises, a mobile switching center for providing the complex wireless terminal with an automatic call forwarding and handoff, and a wired and wireless complex gateway for providing a communication through an extension wireless service network, the method including:

performing location registration in the home location register when the mobile switching center receives a location registration signal from the complex wireless terminal;

confirming, when there is an incoming request for the complex wireless terminal, whether a location of the corresponding complex wireless terminal is registered in the mobile communication service area using the home location register by the mobile switching center; and

providing, when the location of the complex wireless terminal is registered in the mobile communication service area as a result of the confirmation, a communication through the base station controller and base station transceiver subsystem by trying an incoming to the complex wireless terminal using the mobile communication phone number, and when the location of the complex wireless terminal is registered in the extension wireless network service area as a result of the confirmation, the communication through a public exchange by trying the incoming to the complex wireless terminal using the public phone number and the wireless terminal unique number.

10. The method according to claim 9, wherein the step of providing the communication comprises the sub-steps of:

maintaining the communication when the complex wireless terminal moves to an extension wireless network service area while making a communication and requests extension location registration; and

releasing the call and performing extension location registration in the complex wireless terminal when the call is completed.

11. The method according to claim 9, wherein the step of providing the communication comprises the sub-steps of:

performing extension location registration by the mobile switching center when the complex wireless terminal moves to an extension wireless network service area and requests the extension location registration; and

releasing a communication establishment to the complex wireless terminal through the base station controller and base station transceiver subsystem and providing a communication through an extension wireless network whose location is registered by way of the public exchange by the mobile switching center.

12. The method according to claim 9, wherein the step of maintaining the communication when the complex wireless terminal moves to the extension wireless network service area, comprises the sub-steps of:

performing location registration by the mobile switching center when the complex wireless terminal moves to a mobile communication service area and requests the location registration; and

releasing a communication establishment to the complex wireless terminal through the public exchange and an extension wireless network and providing a communication by way of a base station controller and a base station transceiver subsystem by the mobile switching center.

13. A complex wireless service apparatus using a wired and wireless communication system, the apparatus including:

an access point which uses a narrow band wireless protocol, is connected to a digital subscriber line access multiplexer in a first area and a private exchange in a second area through a wired and wireless complex gateway in the access point according to a wired network construction connected from a public network or private network, assigns a network connection channel by selectively transmitting information to one or more internal terminals connected to internal part of the complex wireless terminal or private network or transmitting paging information for a terminal incoming, and receiving a connection signal from the wireless complex terminal, provides a gateway function through a public switched telephone network connection, an local area network connection function through an arbitrary wired communication line connection and a handoff function between access points installed in the private network, and transmits or receives a call signal to or from all terminals connected to the private network;

an access gateway which is an Internet protocol-digital subscriber line access multiplexer equipment, provides a subscriber with an ultra high speed data service, provides a network with a

data service by interconnecting to a data network, and performs a voice over Internet protocol service to the complex wireless terminal by interconnecting to a voice over Internet protocol network;

a home location register which is a database installed in each of the private and public networks and storing information of the public or private network subscriber, has a construction capable of a perfect defect monitoring and a real time database processing, and performs registration and cancellation of information on a private or public subscriber and the complex wireless terminal and an update of all information; and

a softswitch and media gateway for being located in the private network and managing a plurality of access points in the private network, performing private network location registration of the complex wireless terminal in the home location register, and performing a handoff of the complex wireless terminal between the private network and the mobile network, and performing voice and data exchanges among the wired network, private wireless network and wireless data network, performing a roaming among different networks, and performing a transfer of a call received from the user to different network.

14. A computer-readable medium having computer-executable instructions for performing a method, comprising:

performing location registration in a home location register when a mobile switching center receives a location registration signal from a complex wireless terminal;

confirming, when there is an incoming request for the complex wireless terminal, whether

a location of the corresponding complex wireless terminal is registered in the mobile communication service area using the home location register by the mobile switching center; and

providing, when the location of the complex wireless terminal is registered in the mobile communication service area as a result of the confirmation, a communication through a base station controller and a base station transceiver subsystem by trying an incoming to the complex wireless terminal using the mobile communication phone number, and when the location of the complex wireless terminal is registered in the extension wireless network service area as a result of the confirmation, the communication through a public exchange by trying the incoming to the complex wireless terminal using the public phone number and the wireless terminal unique number.

15. The computer-readable medium having computer-executable instructions for performing the method of claim 14, wherein the step of providing the communication comprises of:

maintaining the communication when the complex wireless terminal moves to an extension wireless network service area while making a communication and requests extension location registration; and

releasing the call and performing extension location registration in the complex wireless terminal when the call is completed.

16. The computer-readable medium having computer-executable instructions for performing the method of claim 14, wherein providing the communication comprises of:

performing extension location registration by the mobile switching center when the complex

wireless terminal moves to an extension wireless network service area and requests the extension location registration; and

releasing a communication establishment to the complex wireless terminal through the base station controller and base station transceiver subsystem and providing a communication through an extension wireless network whose location is registered by way of the public exchange by the mobile switching center.

17. An apparatus, comprising:

a mobile switching center determining whether an access point is provided with an extension wireless network service for a plurality of wireless terminals with reference to registration information and performing an extension location registration when the access point is provided with an extension wireless network service for the wireless terminals by using identification information of the wireless terminals, said wireless terminals being mobile terminals supporting plural bands and plural modes; and

a gateway providing a connection between an extended network and a public network, a connection with a wired terminal through a wire when a service is requested for a wired subscriber from the public network, and a connection with the plurality of wireless terminals through the access point when a service is requested for the wireless terminal by using the identification information of the wireless terminal transferred from said mobile switching center when the incoming request includes the identification information for the wireless terminal.

18. The apparatus of claim 17, further comprised of said gateway providing a service through a public network by way of a public exchange when said gateway requests to be connected with the public phone network in an extended network, said gateway tries to receive a call through the access point when said gateway receives a forwarding request for an extended number of the wireless terminals, when said gateway fails to receive the call, said gateway transmits an absent subscriber message, or try to receive the call with a mobile communication phone number of the wireless terminals using information on a location registration of the wireless terminals transmitted from a home location register.

19. The apparatus of claim 17, with said mobile switching center performing the extension location registration for the wireless terminal in a register when the extension location registration is requested by the wireless terminal, and, when an incoming request is made in the wireless terminal, trying the incoming using the public phone number of the wireless terminal and identification information when the wireless terminal is located in a certain area with reference to the register and trying the incoming using the mobile communication phone number when the wireless terminal is located in a mobile communication service area.

20. The apparatus of claim 19, further comprised of said gateway for trying the incoming with the wireless terminal using a wireless terminal unique number as the identification information transmitted from the mobile switching center through the public exchange when the incoming request including the wireless terminal unique number for the wireless terminal is made from said

mobile switching center

21. The apparatus of claim 17, wherein when an incoming call request for said wireless terminals located in an extended wireless network service is received through a mobile communication phone number, said mobile switching center confirming whether an extended wireless network can be currently serviced for said wireless terminals and transfers the incoming call to the corresponding extended wireless network.

22. The apparatus of claim 17, when said mobile switching center receives a forwarding request of a mobile communication phone number of said wireless terminals, providing a call forwarding in order to provide an extended wireless network service.

23. The apparatus of claim 17, when the incoming call is incoming from said mobile communication network during an extended service, said gateway transmitting a busy message instead of the wireless terminals transmitting the busy message.

24. The apparatus of claim 17, wherein when the wireless terminals move from an extension wireless network service area to a mobile communication network service area, the wireless terminals sensing a pilot signal of the mobile communication network and inform said mobile switching center of their movement through a base station transceiver subsystem and a base station controller, said mobile switching center being connected with the base station controller, and the

base station controller being connected with the base station transceiver subsystem.

25. The apparatus of claim 17, wherein when one of the wireless terminals moves from the extension wireless network service area to the mobile communication network service area, said gateway receives the location information for the wireless terminals from said mobile switching center and converts the service into other extension wireless networks where the wireless terminals are located or into the mobile communication network where the wireless terminals are located.

26. The apparatus of claim 17, wherein when the wireless terminals located in the extension wireless network service area receive the outgoing call for other mobile communication network service subscribers, said gateway provides a communication through a public exchange, a toll exchange and said mobile switching center.

27. The apparatus of claim 17, wherein when one of the wireless terminals moves from the extension wireless network service area to the mobile communication network service area, said mobile switching center provides a communication without any interference when it is sensed that the wireless terminals moved from the extension wireless network service area to the mobile communication network service area, the communication without any interference being provided by when said mobile switching center is interconnected to a public phone for the wireless terminals and senses that the wireless terminal moved to the mobile communication service area, it is sensed using a mobile communication network pilot sensing message received from the wireless terminal,

while providing a communication service, a communication line to the wireless terminals is established through a base station controller and a base station transceiver subsystem.

28. The apparatus of claim 17, with said gateway further comprising:

a trunk connection unit connected to an exchange;

a switching unit connected with said trunk connection unit and providing for switching;

a subscriber connection unit connected with said switching unit and the subscribers; and

a control unit connected with said trunk connection unit, said switching unit and said subscriber connection unit, said control unit manages a subscriber and a database, which analyzes signals received from said subscriber connection unit and said trunk connection unit and then requests a connection to said switching unit, when said control unit receives a service request for a wireless subscriber from the exchange through said trunk connection unit, said control unit controls said switching unit and said subscriber connection unit and then establishes a communication line to one of said wireless terminal.

29. The apparatus of claim 17, with said wireless terminal comprising:

a high frequency unit supporting the plural bands, said high frequency unit including a duplexer, a receiver, a transmitter, a middle frequency processing unit of receiving side and a middle frequency processing unit of transmitting side.

30. The apparatus of claim 29, with said wireless terminal further comprising:

a base band unit supporting the plural modes, and including said base band processing unit and a memory.

31. An apparatus, comprising of:

a register storing a database of a mobile communication phone number for the complex wireless terminal supporting plural band and plural mode, whether an extension location is inside or outside, a public phone number, and a wireless terminal unique number;

a mobile switching center for performing an extension location registration for the complex wireless terminal in the home location register when the extension location registration is requested by the complex wireless terminal, and, when an incoming request is made in the complex wireless terminal, trying the incoming using the public phone number of the complex wireless terminal and wireless terminal unique number when the complex wireless terminal is located in a certain area with reference to said register and trying the incoming using the mobile communication phone number when the complex wireless terminal is located in a mobile communication service area;

a gateway for trying an incoming with the complex wireless terminal using the wireless terminal unique number transmitted from said mobile switching center through the public exchange when the incoming request including the wireless terminal unique number for the complex wireless terminal is made from the mobile switching center;

a packet data serving node and foreign agent being interconnected to a base station controller and said gateway, assigning a mobile Internet protocol for a data service to the complex wireless terminals and establishing a point to point protocol according to the mobile Internet protocol

assignment accommodating a data communication with an Internet protocol network; and

a home agent managing a plurality of the foreign agents, and maintaining the mobile Internet protocol accommodating the data service being serviced without communication disconnection when the complex wireless terminals move to other service areas.

32. The apparatus of claim 31, wherein when the wireless terminals are assigned a mobile Internet protocol and a data service is requested from the wireless terminals, the request signal is provided to said gateway through an access point.

33. The apparatus of claim 31, wherein said gateway transmitting the data request signal requested through an access point to the packet data serving node and foreign agent and connected to the Internet through said packet data serving node to provide data service to a user.

34. The apparatus of claim 31, wherein when a data service is requested in the complex wireless terminals, both an Internet connection through an extension Intranet and a connection through a public network packet data serving node is provided, where said packet data serving node is interconnected to said gateway and the base station controller.

35. The apparatus of claim 31, wherein when the data service incoming in the complex wireless terminals, the incoming request of the current location of the corresponding terminal is made to the corresponding base station transceiver subsystem or said gateway obtained through said

register by managing a mobile Internet protocol assigned in said packet data serving node and foreign agent.

36. The apparatus of claim 35, wherein the data service, when the wireless terminal is handed-off, mobility of the terminal to which a mobile Internet protocol is assigned is guaranteed and the terminal is serviced through said packet data serving node.

37. The apparatus of claim 31, wherein when receiving the data service and when the wireless terminal is out of the service area of the extension network, the register changes the location registration of the corresponding terminal, and the packet data serving node and foreign agent is assigned another mobile Internet protocol of the corresponding terminal.

38. The apparatus of claim 31, with said home agent tunneling the data received through the mobile Internet protocol registered in the first extension network to a mobile Internet protocol newly registered through a location movement to the public network accommodating the providing of the data service to the corresponding wireless terminal without data service interference.

39. A method, comprising of:

receiving an incoming call for a complex wireless terminal having plural bands and plural modes;

confirming a location of the complex wireless terminal;

determining whether the location of the complex wireless terminal is in an extension network or mobile communication network;

transmitting the incoming signal to a wired and wireless complex gateway when the location is the extension network and establishing the call;

determining whether the complex wireless terminal moves into the extension network when the location is determined to mobile communication network; and

when the complex wireless terminal moves to the extension wireless network service area, the mobile switching center maintaining the call passing through the mobile communication network and releasing the call when the call is completed and, registering the new location.